

How to... Mark Objects in Museum Collections

PART I: Barrier Coats, Pens, Inks, Paints

In 1994 the Registrars' Committee of the American Association of Museums and the American Institute for Conservation formed a joint committee to study the methods that museums use to mark objects and to make recommendations regarding appropriate marking techniques and materials. The committee's primary goal was to identify acceptable solutions and standards for marking objects. The author serves as Co-Chair of this committee, and this report is based in part on the committee's surveys and deliberations.

In considering the issues relating to marking as a fundamental museum activity, important questions arose: can methods of labeling be standardized among collection categories? Can objects be marked without causing permanent damage to them? Can the person doing the marking be harmed by toxic materials used in improper ways or under the wrong conditions? Should the markings be **reversible**? Conservators, curators, and registrars disagree on the question of whether identifying marks or accession numbers should be removed when items are deaccessioned.

Is there a relatively inexpensive marking substance available, or should museums be investigating other possibilities? Is bar-coding the ultimate solution? How does one ensure that labels stick, and to what should they be stuck? What effects do adhesives have on

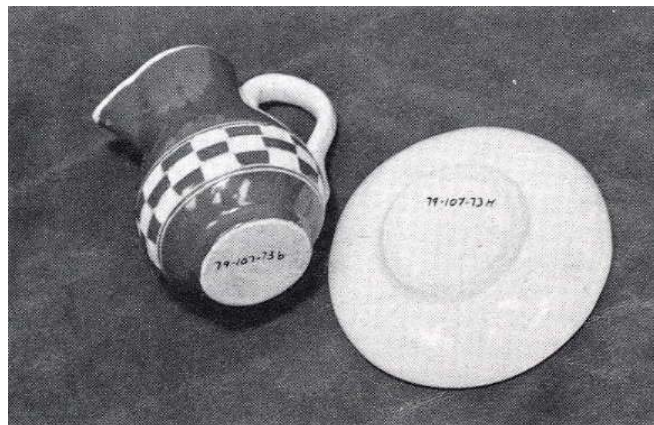
objects over time? We do not know about the long-term impact and stability of newly developed chemical substances that might be considered for possible use. All suppliers, brand names, and products referred to in this report are current as of the date of this publication, but no one can predict their long-term viability.

Why mark objects?

Labeling objects for identification is a basic function of collections management in museums of all types. The use of numbers and letters applied to the surface of an object, whether part of the permanent collection or a temporary loan, allows museum personnel to maintain inventory control. Furthermore, labels provide a form of security in worst-case scenarios, such as theft or disaster. Marking serves as a means to connect an object with its documentation and other information.

Where should objects be marked?

For proper collections management, criteria or guidelines for label placement locations must be created. Uniformly located marks ensure that handling and movement (for obvious reasons both should be avoided wherever possible) are minimized during inventory searches. The standardized locations for the marks should be noted



Using small numbers, mark objects in unobtrusive places, marking similar objects in standard places and away from maker's marks.

in the museum's documentation procedures guidelines.

The general rule is **mark objects in an accessible location that is not generally visible to the public when the object is on display. Choose stable surfaces unlikely to be destroyed by abrasion. Avoid marking places where an object sits (e.g., its base), where it will be touched when routinely handled, and where the surface is flaking or damaged.** Pieces of furniture, such as chests of drawers, are generally marked on the upper right hand rear corner. Large pieces of glass or china should be marked on the lower side of the object not visible to the public. If the object is visible from all four sides, the mark should be placed underneath. Chairs are generally numbered on the right rear seat rail. For objects in storage, the correct object number should also be attached to the appropriate storage shelf or container. Unframed paintings should be marked on their stretchers. Framed paintings should be marked on either the right or left frame edges (be consistent) and the stretchers. Do not mark a damaged object near or on a fracture. Mark all detachable pieces of an object. If an artifact is made of two different materials, mark the most stable section. For example, if something is composed of celluloid and metal, label the metal portion.

Direct surface marking is not appropriate in some instances. Certain objects may require that labels be placed in, on, or near their containers. For example, natural history specimens stored in liquid preservatives should have Resistall™ or similar water resistant paper labels marked with permanent ink inside the containers and an additional label on the outside. For insect collections, if numbering is necessary, place the number on a card mounted on the pin

There is no one superb marking material that works well for all collection objects. According to conservation consultant Helen Alten numbering poses several conservation problems, many of which will not appear until years after the number has been applied. Lacquers yellow, inks bleed, metal-edged tags and metal pen tips scratch, strings and wires cut, sewing creates holes, acidic papers and the edges of corroded metal tags stain. Numbers fade away, discolor, fall off, or separate. The ideal numbering system should:

- Not damage items during application or over time
 - Attach numbers permanently but unobtrusively
 - Not fade from light, nor in acid or alkaline environments
 - Not rub, smear, or float off
 - Be easy to remove
-
- Be easy to use and teach
 - Employ easily obtainable materials

- Consist of materials that are not hazardous to health

Marking Materials

There are three semi-permanent methods of marking objects:

1. Labels on barrier coats: Create a barrier "sandwich" with a bottom layer of lacquer, a painted or written number, and a top barrier coat.
2. Sewn, tied, or adhered labels: Place the number on a tag or label and attach it to the object or to the container in which the object is located.
3. Labels written directly on the piece. This is the most invasive of the semipermanent methods; marks are often not easily removed.

Occasionally, permanent markings are necessary. Engraving may be needed to mark such special collections as the interpretive materials used at living history sites. There are more advanced marking devices, such as bar-coding and transponders (radio activated microchips). Both are exciting possibilities, but not practical for many of us.

Before marking any object, the surface must be clean. Use a soft clean brush to dust the area. **Do not use any solvent or cleaning fluid (even water) on an object without seeking advice from a conservator. Do not attempt to clean unstable areas.**

Barrier Coats

The most extensively used marking techniques employ barrier coats. Most commonly a light strip of lacquer is placed on the object (away from any maker's identification). After about 15 minutes, the numbers or identifying marks are then applied to this base coat. The marks are allowed to dry for several additional minutes and then a top coat that is a little shorter than the bottom coat is applied. In humid conditions allow additional drying time. If the object is dark in color, a coat of lacquer mixed with a white pigment may be layered over the base coat. The second coat must be smaller than the first to allow proper removal of the bottom coat should removal be subsequently necessary. Apply the top coat in a light fluid movement; try dabbing it on if there is a problem with smearing. Before marking anything, always know and have available the correct solvent necessary to remove the



These are representative varnishes for barrier coats. Be certain to use the one appropriate for the object's finish. Do a test and check for damage.

lacquer. Note the name of the lacquer used in the object's accession records for future reference.

There are many types of lacquers, all with different properties. The following information may help in your decision on what product or products to use.

1. **Nail Polish:** This acrylic lacquer is based on cellulose nitrate with many additives, often including formaldehyde. Although the material is easy to obtain, it will yellow and damage metal objects. Nail polish will chip or float off. It can be removed with acetone/nail polish remover which may damage some surfaces. Because this product also poses a potential health threat, **nail polish is not recommended.**
2. **Acryloid B67™:** This acrylic resin is available in crystalline form or from suppliers in a 40% mixture with mineral spirits. The crystalline form is difficult to blend with solvents. The substance may yellow over time and is removable by mineral spirits. Acryloid B67™ in petroleum benzene is available from the Upper Midwest Conservation Association and is removable by mineral spirits.
3. **Soluvar™** by Liquitex: This commercial varnish is a combination of Acryloid B67™ and sometimes Acryloid B10™ with mineral spirits. Use the gloss finish, as the matte finish turns cloudy. Soluvar™

may yellow over time. It is obtainable from art supply stores and some conservation supply firms. It comes in quart containers and may require the addition of mineral spirits if it thickens. Mineral spirits will dissolve Soluvar™. **Do not use Soluvar™ on wax or waxed surfaces.** Conservators do not care for ready-to-purchase products, however, many museums do not have proper lab facilities to mix chemicals, and the premixed material may be worth considering. If the product is too strong, additional mineral spirits may be added.

4. **Acryloid B72™:** This acrylic resin is available in crystalline form or in a 40% blend with toluene (very toxic) or a 25 % blend with acetone (toxic). The lacquer is removable by acetone, toluene, or xylene (very toxic). It is best to get a blend with acetone, and apply the lacquer in a well ventilated room. **Acryloid B 72™ may damage painted, lacquered, or plastic surfaces.** Some users experience problems with the application of the top coat because acetone can dissolve the bottom coat. This lacquer requires adequate drying time. The lacquer is available from Light Impressions (**Liquid Label™**). If the lacquer thickens add a few drops of acetone with a medicine dropper. **When using any toxic solvent be certain to follow the directions carefully.**
5. **White base coat:** Light Impressions markets a white pigment dissolved in B72 and acetone for use over the clear base coat (**Liquid Label™**). Make certain the bottom base coat is longer than the white coat. Use the white lacquer over the clear base coat for dark colored objects.
6. **PVAs and acrylic emulsions:** Avoid these lacquers because they are more problematic than the other base coats.

Recommended at this time Acceptable lacquers are: **Acryloid B72™** in a 25% solution of acetone (may damage painted or lacquered surfaces), and **Soluvar™** (will damage wax and waxed surfaces), and **Acryloid B67 in Petroleum Benzene™**(will damage wax and waxed surfaces). All of the lacquers will damage plastic.

DO NOT USE fingernail polish, fingernail polish remover, spray varnishes, typewriter correction fluid or silicone products (they are not reversible), PVA resins (polyvinyl acetates), or acrylic emulsions or dispersions (acrylic gloss and matte mediums) unless a conservator is available.

Application of Numbers

Numbers should be easily read, but not more than a quarter of an inch high. Large pieces of

equipment are a possible exception, but even then use the smallest letters possible. Use pens with inks that do not contain damaging solvents but do contain a high level of mineral pigment. When using a pen avoid surface abrasions. **All commercial pens should be tested before use.** Red ink or red pens should not be used; individuals who are color blind are unable to identify the color, and red is not as lightfast as black. Pens that provide dense color and fine lines are the ideal.

Marking Applicators: Traditional marking devices are crow quill pens and fine paint brushes. Both are difficult to use unless the user has prior experience or is willing to practice continually. The brushes should be very fine sable or camel hair (000 to 00000). Rounded nib crow quill pens appear to work better than the small pointed ones, but are difficult to locate. Fine technical drafting pens such as **Rotring™** or **Koh-I-Nor Rapidograph™** pens serve as an alternative solution. Rapidograph™ pens require frequent cleaning and almost continual shaking to produce acceptable results. When functioning well, they are excellent, but require a light touch in application. Use fine (.35) or very fine (.25) points. Refillable artists' pens, like the **TRIA™** pen recommended by Helen Alten, offer an alternative solution. The TRIA™ pen has three felt tip points and may be filled with acrylic paints or inks. Filling the empty pen presents a challenge. One suggestion: dip the fine or medium point into the "ink" of your choice. **Concerns: Any metal nibbed pen can cause abrasion and there is always the potential for damage from ink splatters.**

Paints and Inks: Fluid acrylic paints may be used with brushes, nibbed pens, and artists' refillable pens like the **TRIA™** pen, but not in the **Rotring™** or **Koh-I-Nor**

Rapidograph™ pens. Some fluid acrylic paints contain ammonia; they should not be used because they will damage metals, especially copper. Use paints and inks with high pigment content, especially for black markings (look for high carbon content) to find the best lightfastness.

Acrylic paints by **Golden™** and **Liquitex™** in "Carbon Black" and "Titanium White" work well in tests.

Rotring 17 Black™ and **Pelikan Drawing Ink FT, Black™** are considered excellent.

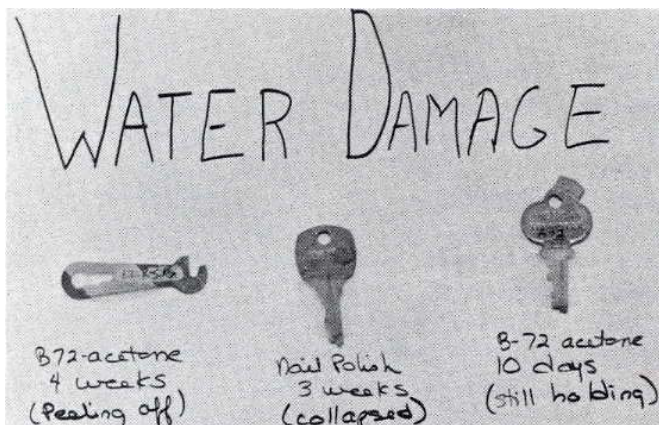
Commercial pens: Conservators generally dislike commercial products because the manufacturers often change the content without any notice, and it is difficult to determine what ink, solvents, etc. are used in a manufactured pen. Often even a small change will affect the lightfastness, durability, or acidity of the ink. Therefore, it is always best to test the pens before use if possible. Like barrier coats, pens range in quality and performance.

Suggested tests: Helen Alten suggests taking a piece of **Tyvek™** envelope and marking it with the pens you want to test. Hang the envelope outside for a summer and determine what inks survive. The legible marks represent inks with good lightfastness. I have no clothesline, so I mark Tyvek with a variety of pens and place it in a sunny window. I do the same with wood, glass, leather, and plastic using a variety of base coats and pens. Another test includes writing with a variety of pens on three types of paper: Tyvek™, an acid free label, and a piece of **Resistall™** paper. Each piece of paper is placed in a container of water for several weeks. Unstable marking compounds will run or smear almost immediately. Some inks will turn a purple-brown color and will fade almost completely. Some pens will not write on all surfaces, particularly on plastics, including the barrier coats. In other tests, marks were placed on keys using Acryloid B72™ and nail polish. The keys sat in a container of water for three weeks to simulate flood conditions. Both lacquers peeled and the nail polish actually floated off, leaving damaged metal. Terry Segal, assistant registrar at the Detroit Institute of Arts, recommends the



Numbers can be applied using various nib pens, brushes, and drafting pens. The intensity of the coloring pigment is important; for black ink, look for high carbon content.

following tests: 1) Write with the ink or pen you are testing on a variety of materials: glass, paper, plastic, cloth tape, and metal. Bleeding or beading will be immediately apparent. 2) Check for abrasion



This test was to prove the underwater stability of acrylic resins. The nail polish has collapsed, and it damaged the metal of the key after three weeks. While most collections will not be under water for extended periods, high humidity is equally damaging.

resistance by rubbing. 3) Check for resistance to water and solvents (when dry) by immersing in, or wiping with a swab moistened with water, alcohol, or acetone. 4) Check for lightfastness by writing on paper or cloth tape and placing in a sunny location. Draw a line with each ink or pen and cover one section of the line to block light. Compare the exposed and hidden areas after four to eight weeks. 5) Acidity can be tested by writing on a paper that measures pH.

Disposable Marking Pens: In 1988 Rose M. Wood and Stephen L. Williams conducted "An Evaluation of Disposable Pens for Permanent Museum Records," a survey of marking pens. Eight pens were evaluated. The **Micron Pigma Pen™** and the **Marsgraphic Pigment Liner™** were judged able to write well on substances other than paper, but none wrote well on plastics. Tests conducted by Helen Alten in 1995 on felt or nylon-tip pens, examined lightfastness, chemical solubility, and whether or not they could be used on barrier coats. Three pens met the criteria: the **All-Stabilo Pen 166P™** (permanent, fine); **Pilot SCA-UF™** (ultrafine point, permanent, no xylene) and the **Identipen 441™** series dual marking pen by **Sakura™**.

1. **Micron Pigma Pen .01, Sakura™:** This pen is excellent for writing on twill tape used to mark textiles. It does not work well on plastics, including barrier coats. Some institutions are having success using it with Soluvar, but it did not work well for some users.
2. **Pilot, SCA-UF™:** This pen met Helen Alten's standards. It is available from most artist supply houses.
3. **All-Stabilo Pen 166P™:** This pen tested well for Helen Alten. It is available from most artist supply houses.
4. **Sanford Sharpie Ultra Fine Point™:** This pen is easy to use, and writes well on glass or plastic, but its pigment value may vary. It held up well under water on Resistall™, Tyvek™, and acid free paper. It is available from art supply stores.

5. **Identipen™ Sakura™:** This pen comes with two points (extra fine and fine). It writes well on acrylic resins, and does not smear when top coats are applied. The extra fine tip is better for marking purposes than the fine tip. **Identipen™** is available from **Gaylord Archival Products™** and from some art supply stores.

6. **Staedtler Lumocolor 313™:** This pen writes well on paper, but the black ink turns blue on

acrylic resins and when immersed in water.

7. **ZIG, Millennium™, Juretake Co™:** This pen did not write well on plastic, but did well on paper after immersion in water. It is available from art supply stores.
8. **Kaiser Schreiber™:** This pen is designed for marking film. The ink fades dramatically under any light, on acrylic resins, and when immersed in water.
9. **White Commercial Pens:** No pens are acceptable.

Recommended at this time: The commercial pens recommended are: **Pilot, SCA-UF™, Identipen™, All Stabilo Pen 166 P™, and the Sanford Sharpie™** (check color intensity). Use the **Micron Pigma .01** for twill tape. For white markings, use the **Light Impressions Liquid Label™** in white over the barrier coat, or use a rounded nib pen or brush with **Golden™** or **Liquitex™** fluid acrylic paint in Carbon Black or Titanium White. For inks, use **Rotring 17 Black** or **Pelikan Drawing Ink FT™ Black** with either a brush, **Rapidograph™** pen, or rounded nib pen. **DO NOT USE White commercial pens, red ink, chalk, or ball-point pens.**

Vendors:

American Science and Surplus (Zap Ties)
3605 Howard Street
Skokie, IL 60076
(708) 982-0870

Canus Plastics (Skived Teflon Tape)
300 Lisgar Street
Ottawa, CA K2P 0E2
Canada
(613) 232-2657

Conservation Materials, Ltd. (Acryloid B-67 resin crystals, Soluvar, B72 (toluene))
1395 Greg Street, Suite 110
Sparks, NV 89431
(702) 331-0582

Conservation Resources International, Inc. (Soluvar, other supplies)
8000 H Forbes Place
Springfield, VA 22151
(800) 634-6932

Daniel Smith's Artists Supply (pens, inks, brushes, etc.)
4150 First Avenue, South
PO Box 84268
Seattle, WA 98124-5568
(800) 425-6740

Gaylord Brothers (Identifier pens, methyl cellulose, wheat starch, cloth labeling tape, cotton tying tape, archival supplies, acid-free tags)
PO Box 4901
Syracuse, NY 13221-4901
(800) 448-6160

Light Impressions (B72 in acetone, white barrier coat, archival supplies)
439 Monroe Avenue
PO Box 940
Rochester, NY 14603-0940
(800)828-6216

Penco Graphic (pens, inks, brushes, Soluvar)
718 Washington Ave. N
Minneapolis, MN 55401
(612) 333-3330

Talas (Japanese tissue paper, wheat paste, methyl cellulose, conservation supplies)
568 Broadway
New York, NY 10012-9989
(212) 219-0770 catalog costs \$5

University Products (wheat starch, methyl cellulose, Japanese tissue paper, Micron Pigma Pens, archival supplies)
517 Main Street
PO Box 101
Holyoke, MA. 01041-0101
(800) 628-1912

Upper Midwest Conservation Association
(marking kit costs \$40)
2400 3rd. Avenue, South
Minneapolis, MN 55404
(612) 870-3120

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